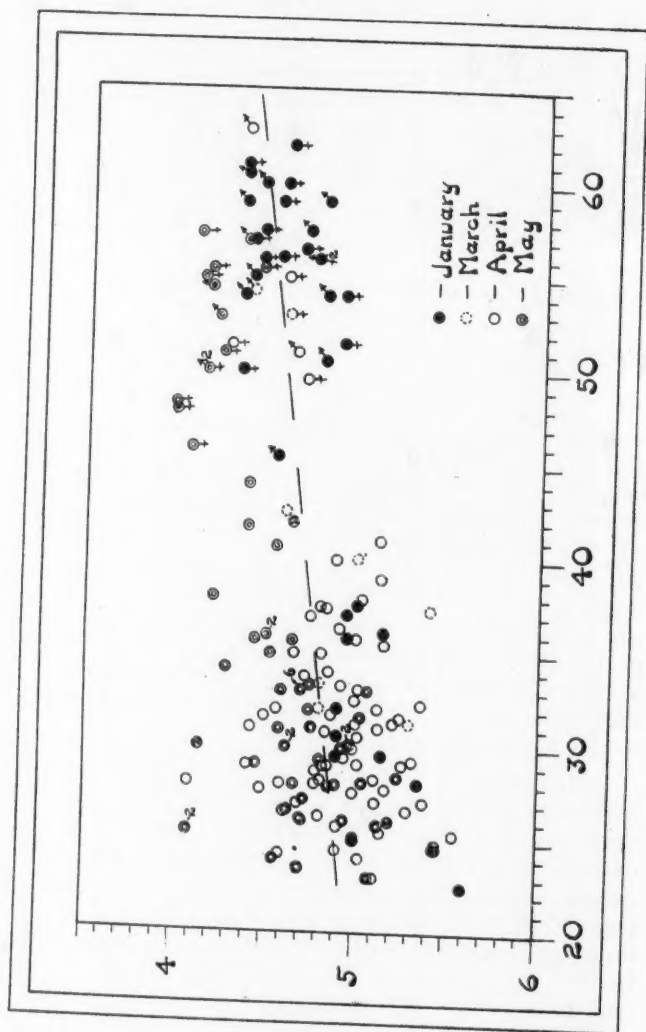


Published to advance the Science of cold-blooded vertebrates

FURTHER NOTES ON *Leuciscus vandoisulus*
(CUV. & VAL.)

Jordan and Evermann (1896, "The fishes of North and Middle America") state that in this species "the largest specimens are most elongate." The writer in making a collection of this Cyprinoid from a single site in a run near Washington, D. C. (*Copeia*—May 20, 1920, No. 82, pp. 35-38) in January, March, April and May of this year found exactly the opposite condition to exist, which would be just the expected variation when it is considered that the large majority of fishes are more slender in early life, while the proportions found by the above-mentioned authority are highly unusual.

In the accompanying diagram the horizontal scale indicates standard lengths in millimeters, and the vertical scale body depths, times in the respective standard lengths. Each circle indicates one individual except where numbers call attention to the superposition of more than one. Various symbols have been used as indicated to differentiate the four collections. February is not represented owing to the fact that our seine yielded no specimens of this species during that month. The sex is marked with the conventional symbols where it was possible to determine it with the aid of a simple lens. The diagonal dashed line, computed from arithmetical averages, roughly indicates the moving trend and distinctly shows the



larger specimens to be deeper than the small ones, which places these fishes in direct contradiction to

the relative proportions that Jordan and Evermann ascribe to the species. It is also evident that immature specimens are much more variable in this respect than adults, for while the average body depth is less the range almost includes that of the adults.

The diagram also indicates that as the season advances the fishes become deeper, which no doubt can be attributed to heavier feeding and in the case of mature individuals, to increased bulk of the generative organs and their products. A comparison of those taken in January and in May brings out this fact well, it being seen, especially in the mature fish, that those taken in May form quite a distinct group from the January specimens.

The division of the year classes, as noted in the previous paper, is well indicated in this diagram. Of course the cluster including the sex symbols represents the mature group while the other forms the immature. The writer believes that the nine individuals grouped between 40 and 45 mm. in standard lengths can without doubt be designated either as precocious yearlings or excessively backward specimens of the two-year class. Probably examples of both extremes are there present.

A character of marking retained in preserved material, though not mentioned in any description so far found by the writer, is a narrow dusky line that has its origin about midway between the insertion of the dorsal fin and the operculum in the upper margin of the light lateral band immediately over the plumbeous one. From this point it runs backward and down, cutting diagonally across the light band and merging with the plumbeous streak below the base of the last dorsal ray but still traceable out onto the caudal peduncle, although confluent with the heavier stripe. This mark is not at the surface but lies directly below it and is visible at the points mentioned only because

it is there not superimposed upon by opaque pigments. This line is apparently a mere concentration of pigment in the fascia covering the myotomes along the division separating the dorsal from the ventral series. Other lines similar but lighter, and not visible through the scales, are present between each consecutive myotome. While this is said to be found in other Cyprinidae, such as *Chrosomus* and other species of the genus *Leuciscus*, the writer has found it extremely useful in roughly separating the very small individuals of this species from others of the family similar in general aspects and taken from this particular locality.

In the belief that a comparison of measurements might prove useful to other workers, there are appended below the averages which the writer obtained from 36 representative specimens, as compared with corresponding measurements quoted from Jordan and Evermann's publication of 1896 and Fowler's Synopsis of the Cyprinidae of Pennsylvania, 1908.

	Fowler	J. & E.	Breder
Head	3 2/5-4	3 2/3	3.78
Eye	2 7/8-3 1/2	3 1/2	3.43
Maxillary	2-2 1/3	....	2.56
Interorbital .....	....	....	2.86
Snout	3 1/8-3 7/8	....	3.13
Depth	3 3/4-4	3 3/4-4	4.75
Lateral line.....	44-52	48-58	40-56
Above l.l.	10	....	10
Predorsal	24	....	28
Teeth	2, 5-4, 2	2, 5-5 or 4, 2	2, 5-4, 2

Some of the discrepancies can no doubt be accounted for by the fact that the writer's measurements included both adult and immature, while very probably the others refer chiefly to mature specimens. The fin formulas agree with Fowler perfectly, as do other points of diagnosis.

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1919 FISH NOTES FROM ORIENT,
LONG ISLAND

The following records have been sifted from the data collected in 1919 and contain several new early and late dates for the locality.

Mustelus canis. One adult, May 17.

Sphyrna zygaena. One, November 25, 28 inches in total length.

Squalus acanthias. Young very abundant in mid-summer. On July 21, the catch was three farm wagon loads. All that were measured were 20 inches in total length.

Raja eglanteria. Two half-grown on May 12. And the last, one adult, on Oct. 18.

Elops saurus. The largest number of examples seen in recent years was obtained. Twenty-eight specimens from October 6 to November 4. These were from 13 to 15 inches in total length.

Clupea harengus. A few adults 12 inches in length were taken on July 16.

Anchoviella brownii. One November 14, six inches in total length.

Hyporhamphus roberti. One June 14, ten inches in total length. This is the earliest record of its capture here.

Sphyraena borealis. This species was very common during October. On the 17th, five hundred were taken from one trap, in size 8 to 11 inches. The last was taken on November 12.

Mullus auratus. One 4 inches in length on August 20. Earliest record.

Cynoscion regalis. One adult, May 7.

Bairdiella chrysura. One May 23, six inches in length.

Leiostomus xanthurus. One June 16, earliest Orient record.

Menticirrhus saxatilis. One adult, May 9.

Pepilus paru. Two new late records are: One October 11 and one October 20. Both 8 inches in total length.

Poronotus triacanthus. Two adults, May 5.

Trachurus trachurus. Three individuals were taken. One August 28, $4\frac{1}{4}$ inches in total length; one September 19, 5 inches in total length, and one November 1, $6\frac{1}{2}$ inches in total length. All from the Sound.

Trachurops crumenophthalmus. One August 14, $5\frac{1}{4}$ inches in length is the earliest date.

Caranx crysos. One July 26, five inches in length, is also earliest date.

Sarda sarda. One June 15; weight of 4 lbs. The earliest Orient date.

Balistes carolinensis. One September 1, fourteen inches in total length, and one October 27, seven inches in total length.

Alutera schoepfii. One November 14, eight inches in length, is latest date.

Spheroides maculatus. Three adults May 21.

Cyclopterus lumpus. One taken on April 28 that was 21 inches in length and weighed $15\frac{1}{2}$ lbs. Five others were taken on May 17 that were from 5 to 8 inches in length.

Prionotus carolinus. Eight adults on April 16 is an early date of arrival.

Prionotus evolans strigatus. One 7 inches in length on November 15 was the only record for the season. This is the latest date obtained.

Pollachius virens. Young very common throughout the summer. On several occasions during July and August it was estimated that more than a thousand young averaging 5 inches in length were liberated from a trap. They were feeding on the young of the squid, *Loligo pealii pallida*, which were about one inch long at the time and abundant.

Paralichthys dentatus. One April 26, $28\frac{1}{2}$ inches in length.

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NOTES ON *Pseudemys scripta* Schoepff, THE
YELLOW-BELLIED TERRAPIN

In this terrapin the plastron is yellow, usually with a single black spot on one or more of the plates, these being nearly always present on the gular plates and less often on some of the others. The spots on the gulars and the plates immediately behind them are round, and usually solid, but occasionally light centered, and in that case might be termed rings rather than spots; those on the posterior plates are usually elongate when present.

The size and number of the spots varies according to locality, North Carolina specimens having them comparatively few in number, while shells from southwestern Georgia have them on nearly all the plates, as well as larger in size.

Thus, to go into details, out of eighty-one Raleigh *scripta*, two had no markings on the plastron, two had a spot on one gular only, fifty had a spot on each gular, while twenty-six had a spot on each of from three to twelve plates, and one had the plastron too darkly stained to distinguish the spots. The average thus was three black spots to the plastron.

Contrast this with the plastral markings of specimens from Mimsville in southwestern Georgia. Out of fifteen specimens examined, one had a spot on each of the gulars and humerals, three with them on ten plates, two on eleven plates, and nine with them on all twelve plates, the markings, in other words, showing a strong approach to those on the plastron of *Pseudemys elegans*, which Siebenrock in his Synopsis considers a race of *scripta*, and which should, in that case, intergrade with *scripta* in this very region. The average per specimen in these fifteen was eleven plates with black spots instead of three as in the Raleigh specimens, and I also made a note at the same time stating that an examination of twenty-four more from the same locality showed the presence of black spots on most of the plastral plates to be usual in specimens from that region.

Besides the markings on the plastron there may also be present rounded or elongate black spots on the inguinal and axillary plates, or on the portions of the pectoral and abdominal plates extending on the bridge. These are usually absent altogether in the specimens with the fewest spots on the plastron and are never present on all the above-named plates on the same shell in any Raleigh specimen I have examined.

This terrapin has become of late years one of the commonest species near Raleigh, the only ones present in greater abundance being the Painted Turtle (*Chrysemys picta*), and the Mud Turtle (*Kinosternon subrubrum*), and it has recently occurred to me that this increase has taken place since the streams near here have been polluted by the city sewage and the refuse from the dye works at the cotton mills. Formerly the River Terrapin (*Pseudemys concinna*) and the Yellow-belly were about equally common, though neither was at all abundant. Now the former has about disappeared and the latter has become abundant.

Returning to the question of the increase in the plastral markings as one goes southwestward, a possibly analogous case is that of another species we have recently taken at Raleigh, namely, *Pseudemys troostii*, which in all the five specimens so far taken here differs from typical *troostii* from the west in having the plastron practically without markings, except a little dark mottling along some of the sutures and in front, in some of the specimens. Otherwise these five appear to be undoubtedly *troostii* and not *scripta*.

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